NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

GRAZING LAND MECHANICAL TREATMENT

(Acre)

CODE 548

DEFINITION

Modifying physical soil and/or plant conditions with mechanical tools by treatments such as; pitting, webb plowing, contour furrowing, and ripping or sub-soiling.

PURPOSES

This practice should be applied as part of a conservation management system to support one or more of the following purposes:

- Fracture compacted soil layers and improve soil permeability.
- Reduce water runoff and increase infiltration.
- Break up sod bound conditions and thatch to increase plant vigor.
- Renovate and stimulate plant community for greater productivity and yield.

CONDITIONS WHERE THIS PRACTICE APPLIES

This standard may be applied on pastureland, rangeland, grazed forest, and naturalized (native) pastures.

This treatment shall be limited to sites that have a high clay content in the surface soils or sites that have an excessive amount of thatch or root mass. Treatments shall not be applied to sandy soils unless the thatch build-up is restricting plant growth.

This practice may be implemented on lands that meet the criteria for wetlands only if the practice will not result in manipulation of a wetland as defined in the NRCS National Food Security Act Manual (NFSAM).

CRITERIA

General Criteria Applicable For All The Purposes Stated Above

Plans for grazing land mechanical treatment shall comply with all applicable Federal, state, and local laws, rules and regulations.

All necessary permits and letters of exemption shall be obtained prior to implementation of this practice.

This practice shall not be implemented on any area where the predicted soil loss will exceed the soil loss “T” for the year of implementation as calculated using the Revised Universal Soil Loss Equation (RUSLE). For additional information on RUSLE, refer to Chapter 6 of the NRCS Florida Agronomy Field Handbook (FAFH).

Mechanical treatments such as contour furrowing, disking, pitting, ripping or sub-soiling shall be designed and applied in a manner to accomplish the desired objectives and address the natural resource concerns. These treatments shall not be implemented on areas that have a slope of 20% or greater. To prevent accelerated soil erosion these treatments shall not be implemented during seasons of the year when high wind and/or rainfall is anticipated. Average soil moisture shall be

between 25% and 60% of field capacity when the practice is applied.

To the greatest extent possible, mechanical treatments shall be implemented on the contour or across the slope of all soils with a slope ≥4%. Where practical mechanical treatments should be applied on the contour of soils with slopes <4%.

Areas to be treated shall be relatively free of undesirable or noxious plants that are likely to increase because of surface disturbance. Noxious weeds present prior to treatment shall be controlled using methods recommended by the Florida Cooperative Extension Service. All areas treated with herbicides shall meet the requirements of the NRCS conservation practice standard for Pest Management, Code 595.

If a natural plant community is desired, desirable forage species shall be of sufficient quantity and have a distribution pattern that allows the plants to take advantage of the improved moisture and to spread into disturbed areas.

This practice shall be planned in conjunction with a prescribed grazing system. For information in developing a prescribed grazing plan refer to NRCS conservation practice standard Prescribed Grazing, Code 528A, and Chapter 5 of the National Range and Pasture Handbook.

An adequate rest (recovery) period from grazing shall be applied following treatment to ensure desired plant responses from this treatment.

1. For treatments on rangeland, grazed woodland and naturalized pasture the recovery period shall be a minimum of 90 days during the active growing season.
2. For treatments on pastureland the minimum recovery period shall be adequate for the desired forage species to recover to the "Minimum Height to Begin Grazing" for pastureland. The "Minimum Height to Begin Grazing" is shown in Table 1 of NRCS conservation practice standard Prescribed Grazing, code 528A.

Additional Criteria Applicable to Fracturing Compacted Soil Layers and Improving Soil Permeability

Chiseling shall be used to fracture hard pans or restrictive layers that occur within 16 inches of the soil surface.

Subsoiling shall be used to fracture hard pans or restrictive layers that are deeper than 16 inches.

Implements shall be used that will penetrate through and shatter the restrictive layer and not bring the subsoil to the surface.

The spacing between chisel and subsoiler shanks shall be set to shatter 75% of the area being treated. The spacing between chisel shanks shall not exceed 24 inches. The spacing between subsoiler shanks shall not exceed 48 inches.

Additional Criteria Applicable to Break up Sod Bound Conditions and Thatch to Increase Plant Vigor

Treatments to reduce sod bound conditions shall create a soil/root mass disturbance 2 to 6 inches deep.

Acceptable results may be achieved using a disk or pasture aerator.

Treatments to reduce sod bound conditions shall be designed to disturb a minimum of 5%, but not more than 25% of the surface area of the treated area.

Additional Criteria Applicable to Renovate and Stimulate the Plant Community for Greater Productivity and Yield

For partial restoration of pastures (*e.g.* broadcast seeding legumes or small grains) the site shall be treated in a manner that provides good soil to seed contact and minimizes soil disturbance. The recommended methods include:

- planting the seed directly into the existing stubble using a drill designed for this purpose.
- lightly disking the area, broadcasting the seed, followed by dragging, rolling or culti-packing the site.

All areas planted to forage plants shall meet the NRCS conservation practice standard for Pasture and Hayland Planting, Code 512.

CONSIDERATIONS

Mechanical treatments to break up sod bound conditions and thatch to increase plant vigor are not economically feasible on bahiagrass pasture grown on sandy soils. Therefore, this practice is not recommended for use on bahiagrass pastures

until research indicates that this practice is cost-effective.

Consider using Prescribed Burning, Code 338 on sites with a sandy or fine sandy soil texture to remove excessive amounts of thatch or root mass build up.

Mechanical treatment may not be desirable on areas to be used for recreation or areas where vehicle traffic may occur due to enhanced surface roughness of the site.

To minimize impacts on wildlife consider treating $^{1}/_{3}$ of a field at a time and avoid treating the area during the primary nesting season of grassland nesting birds (March 1 – July 15).

NRCS practice for Range Seeding, Code 550 and Pasture and Hay Planting, Code 512 may be used in conjunction with this practice.

For additional information regarding planting forage crops refer to the Florida Forage Handbook, UF/IFAS, 1999.

Refer to the Conservation Practice Physical Effects (CPPE) Worksheet in Section V of the Field Office Technical Guide for the effects of this practice on the soil, water, air, plant and animal resources.

PLANS AND SPECIFICATIONS

Specifications for installation of this practice shall be prepared for each site or planning unit according to the criteria in this standard. Specifications shall be recorded using state developed specification sheets, job sheets, narrative statements in conservation plans, or other acceptable documents, and shall state the purpose and degree of treatment needed.

Specifications shall include the following information:

- Primary purpose of the treatment
- Type of treatment (*e.g.* chiseling, sub-soiling, etc.).
- Extent of treatment (*e.g.* 25% of the area will be disturbed) and/or depth of treatment (*e.g.* 3 inches).
- Time of treatment (*e.g*. June 30 – Aug. 30).
- Species to be planted (if applicable).
- Planned recovery period following treatment.
- Location map or sketch of the planned treatment area including north arrow, the direction of treatment and acres to be treated.

OPERATION AND MAINTENANCE

This practice will require some operation and maintenance (O & M), to assure its intended purpose is achieved for the desired life span. The O & M plan may include but is not limited to the following:

- To prevent re-compaction, avoid high cattle density or vehicle traffic on the area when the soils are wet.
- Control noxious weeds, other undesirable vegetation, and pests as necessary to allow desirable vegetation to become established or recover from treatment.
- Re-plant as necessary to achieve the desired plant community.
- Protect from uncontrolled fire and grazing.

If the desired effects of this practice are lost over time, the practice may need to be repeated.

REFERENCES

Kalmbacher, R.S. ”Renovating Bahiagrass Pasture”, Ona Reports, May 1993

Pinkerton, Bruce, Clemson University, Personal Correspondence

NRCS Conservation Practice Standards
Prescribed Grazing, Code 528A
Pasture and Hayland Planting, Code 512
Pest Management, Code 595
Prescribed Burning, Code 338
Range Seeding, Code 550

NRCS Field Office Technical Guide (FOTG), Section V, CPPE

NRCS Florida Agronomy Field Handbook (FAFH), Chapter 6

NRCS National Food Security Act Manual (NFSAM), 3rd ed., Nov., 1996

NRCS National Range and Pasture Handbook, Chapter 5, 1997

UF/IFAS Florida Forage Handbook, C. Chambliss editor, 1999